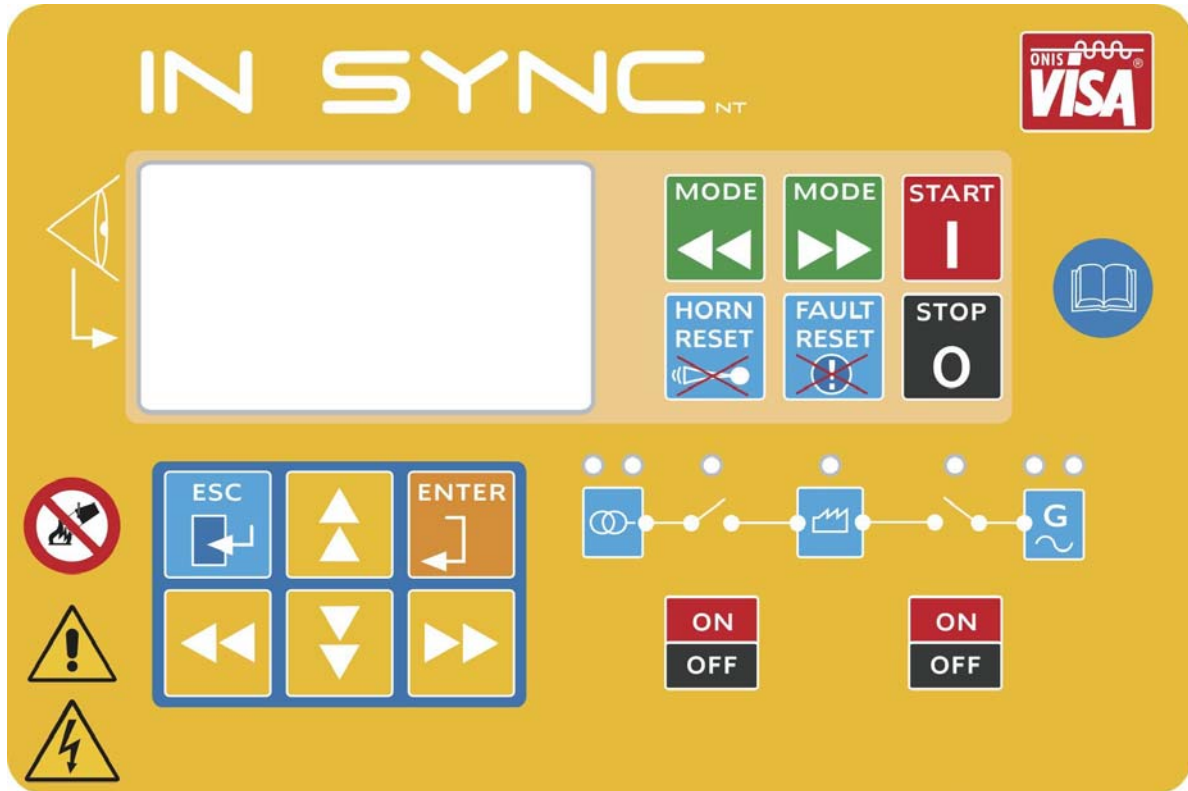




IN-SYNC NT



IN-SYNC NT

USER MANUAL



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1. Introduction

Thank you for having purchased a generating set equipped with the In-sync NT board. We recommend you read this manual carefully and comply with all standards relative to safety and correct use and maintenance of the generating set. Should any doubts arise while reading the manual or using the unit, please contact a Visa technician. The information contained herein is correct at the time of printing but can be changed without prior notice or notification, in line with our objectives of continuous product development and improvement.

This manual, together with the engine and alternator manuals and other documents delivered with the machine, are an integral part of the "Visa Generating Set" (hereinafter called genset). This manual and the attached documentation are intended to be consulted by all those involved in the life cycle of the machine and must therefore, always be kept and made accessible to the user. Compliance with all the safety requirements is the customer's responsibility.



The generating set is a machine intended to be used by duly trained personnel. Errors when installing or using the machine can seriously damage the user's system, the machine itself or injure those involved.

There can be hazardous voltages inside the generating set and the control board even with the genset switched off: do not start-up, perform maintenance, repairs or alterations without specific knowledge or precise guidelines.

All the operations must always be performed in compliance with the safety standards.



Carefully read this manual together with those of the generating set, engine and alternator. If still in doubt, contact a VISA technician or the nearest authorised service centre

The In-Sync-NT board is designed to guarantee maximum programming flexibility and this manual contains the description of the most common functions. Please contact our Sales Department for further information regarding programming options.

There are two main configurations: PGE & PRE (parallel units and parallel to the mains, respectively), each can be customised as described further on. The In-Sync NT can be programmed according to different requirements and can be integrated with software or hardware. Given the complexity of the equipment, it is recommended to always contact the VISA Technical Department for such operations.

The main operating modes are listed below:

- PGE900 individual manual mode.
- PGE900 automatic remote control.
- PGE910 parallel load-sharing manual mode.
- PGE920 parallel automatic load management.
- PRE910S *import* parallel with the mains.
- PRE920S *export* parallel with the mains.
- PRE930S *base load* parallel with the mains.
- PRE940S Automatic for power failure and short parallel with the mains when the power is restored (SPtM hardware and software basic version to be agreed upon with the Technical Department).
- Special modes to be added to the standard modes, upon request

The first part of the manual describes the equipment and its main functions, common to all operating modes. The various applications are then dealt with further on.







IN-SYNC NT



2. General description and key functions







The In-Sync NT device has 14 keys dedicated to programming and general functions. The various functions are described in detail in the paragraphs further on.

2.1. MODE - selecting the mode


KEY	FUNCTION	NOTES
 	<p>These keys are used to toggle between OFF, MAN, AUTO and TEST.</p> <p>Press  or  to move the cursor to the desired mode.</p> <p>Note: a password can be enabled to authorise the operation. The relative procedure is provided below.</p>	<p>DANGER: Switching from one mode to another can start-up the engine or de/activate the mains or genset circuit breakers. Before performing any operation, make sure no hazardous situation can occur</p>

Description of the operating modes:





2.1.1.OFF

When the In-Sync NT device is OFF, the Start and Stop commands on the panel and any external commands, such as remote contacts, special functions and software commands are disabled. The       commands remain enabled to select other modes or view the information pages. The battery charger and pre-heater (if supplied) work normally.

The relay contact in versions equipped with MCB control remains closed when supply voltage is present. If a power failure occurs in such an instance, the genset is not started: the power of the user's system will be disconnected and reconnected as though the genset were not present.




	<p>IMPORTANT: If the device is disconnected via the key or the battery/batteries being disconnected, it starts up in the same mode as when it was switched off! Therefore, the operator must pay particular attention when the machine is restarted so as to prevent unexpected start-ups.</p>
---	---


2.1.2.MAN

When the In-Sync NT device is in MANUAL mode, the genset can be started and stopped via the   keys (see paragraph 2.2). The circuit breaker can also be operated manually via the   keys.

2.1.3.AUTO

When this function is enabled, it allows the unit to be started and stopped remotely or started-up automatically in the event of a power failure.

The manual command keys   and  are disabled. The key can also be removed when it is in the I/ON position.

	<p>DANGER: before selecting the AUTO mode, make sure the genset cannot be started inadvertently due to programming or a connection error</p>
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2.1.4.TEST

In addition to the functions available in the AUTO mode, the input for the empty or loaded generating set periodic test to be performed, is enabled. This function is used to periodically run the generating set to verify its efficiency.



DANGER:

before selecting the TEST mode, make sure the genset cannot be started inadvertently due to programming or a connection error

The In-Sync NT board can control various test modes according to the configuration supplied.

Empty Test	The generating set is started-up once the external command is closed but the circuit breaker on board the machine (GCB) is not closed. The genset continues to run on empty without powering the load. Available in all PRE and PGE configurations.
Loaded Test with short parallel	Available in all PRE configurations. The genset starts-up when the test is activated, then synchronises with the mains, supplies the load itself and opens the mains circuit breaker. The entire load is then powered by the generating set. The inverse process is performed once the test is complete, thereby transferring the load to the mains and switching the genset off. The entire process takes place with no voltage dips.
Loaded Test with long parallel	Available in the PRE910/920/930S configurations. The genset starts-up when the test is activated, then synchronises with the mains, supplies the load while leaving the mains circuit breaker closed. If the load exceeds the power set for the test (<i>basic setting -> base load</i>) the load remains partially powered by the mains. If the load is less, the surplus power is exported to the mains.

The periodic test verifies that the genset is working correctly and prevents power failures. Of course, this does not mean the maintenance technician is not required to perform a direct inspection of the genset through which any anomalies can be noted.




The periodic test can be performed on empty but the loaded test must still be considered as this is more reliable.




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2.2. START / STOP (manual)

KEY	FUNCTION	NOTES
 	<p>START Start-up (activated in manual mode) If the genset is in MAN mode Press this key for the engine to start-up once the “pre-start time” elapses (normally 5 s).</p> <p>STOP This key is used to turn the engine off. Press the key once to open the machine circuit breaker and for the engine to switch to the “cooling” state (empty operation to cool down). The engine goes off after a standard time of 2 minutes.</p>	<p>Engine start-up does not imply the genset circuit breaker is closed. In manual mode, this is performed by pressing the  key (see below).</p> <p>The STOP key is only enabled if the device is used in MANUAL mode with the engine running.</p>











2.3. Closing/opening the unit circuit breaker manually

KEY	FUNCTION	NOTES
	<p>This key is used to operate the unit circuit breaker. In manual mode, with the unit idle, press the unit circuit breaker to close it, thereby powering the electric load connected to the genset. Press the circuit breaker once again to open it.</p>	<p>It is recommended not to use the genset for more than 20 operations/hour in order to prevent the operating mechanism from overheating.</p>

2.4. Closing/opening the mains circuit breaker manually

KEY	FUNCTION	NOTES
	<p>This key is used to operate the mains circuit breaker in any PRE configuration. In manual mode, press this key to close the circuit breaker, thereby powering the electric load connected to the mains. Press the circuit breaker once again to open it.</p>	<p>It is recommended not to use the genset for more than 20 operations/hour in order to prevent the operating mechanism from overheating.</p>

2.5. Display and programming keys

KEY	FUNCTION
     	<p>The default page displays:</p> <ul style="list-style-type: none"> - the OFF, MAN, AUTO and TEST mode; - the load in kW connected to the unit; - the READY, LOADED, etc. status; - the OPEN/CLOSED status of the circuit breaker; - the $\cos\phi$, engine revs, any activated timers, cooling time, pre-starting, etc.; <p>Much more information is available by pressing the yellow keys:    . The ENTER key confirms the selections made. Press ESC to return to the upper level and view the menus.</p>



3. Display data and communications

The In-Sync NT device communicates all the information relative to the generating set, electrical parameters, engine parameters, faults and alarms to the operator via special pages on the display.

3.1. Information regarding the genset (Start-up page)

This page is only visible when the device is switched on. It is useful to obtain all the specifications of the genset and the In-Sync NT version, which are necessary when requesting assistance.

The type and model of the genset, serial number of the device, software version, selected operating mode and type of electrical layout can be viewed on this page (Figure 1).

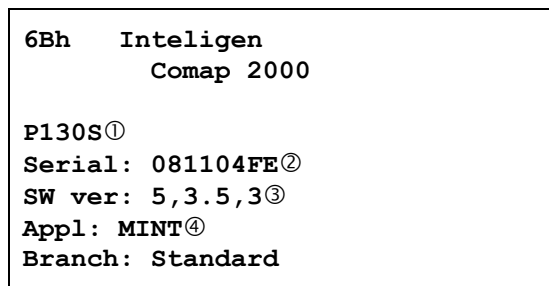


Figure 1: IMPORTANT INFORMATION REGARDING THE GENSET (page 0 start-up)

Figure 1 Key:

- ① Generating set model
- ② In-Sync NT board serial number
- ③ Software version
- ④ Type of application

NOTE: this display only appears for a few seconds. The display then switches to the next page (1), described below.

Once the device is switched on, it automatically displays PAGE 1 (

Figure 2), and automatically returns when the keys are not used for 4 minutes.

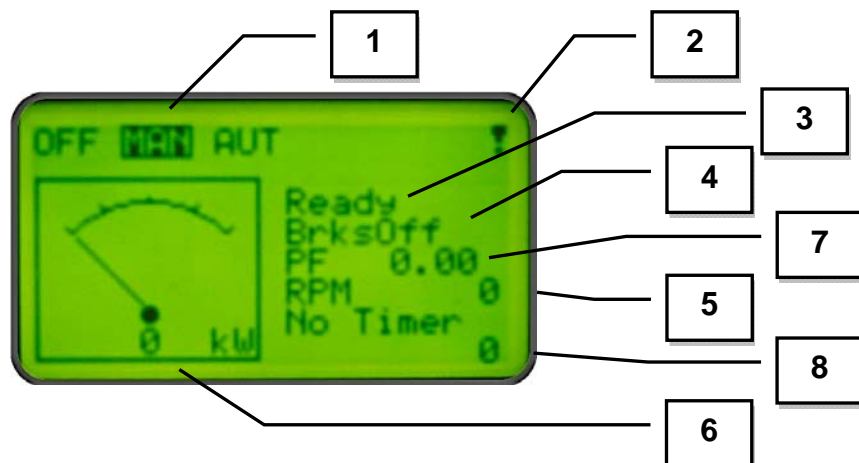


Figure 2: PAGE 1



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Figure 2 Key:

- ① Cursor positioned on OFF, MAN, AUTO or TEST (for the SPtM application)
- ② The exclamation mark indicates a pre-alarm, which is currently not dangerous but must be checked
- ③ Genset status: Ready, Loaded, Cranking, etc.
- ④ Mains circuit breaker status: Open (operates with the mains) or BRKs off (open circuit breaker)
- ⑤ Engine revs per minute
- ⑥ Applied load
- ⑦ Power factor
- ⑧ Countdown in progress, e.g. cooling time is 120 s, the countdown to zero is displayed.

Any active alarms are displayed in a list format:




```
Alarm list 2
Fls Oil press
Fls Water Temp
Service time
```

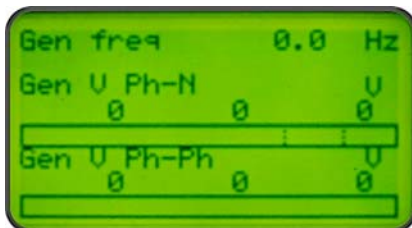
The example above indicates 3 active alarms:

- the alarm signal given by the oil pressure sensor
- the alarm signal given by the coolant temperature sensor
- the warning signal given by the timer indicating the next scheduled maintenance is due

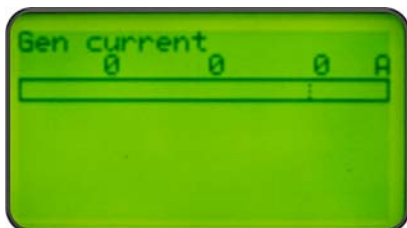
NOTE: the device will permanently display the alarm messages (faults) together with the PAGE 1 parameters until an operator performs a manual reset. The alarm messages remain saved in the device memory, whereas the warning messages are only displayed when they occur.

3.2. Details of additional info displayed on Page 1

As has been mentioned earlier, page 1 displays a lot of information by simply pressing the  or  keys. If the keys are pressed several times, all the screens are displayed, returning to the main page at the end. The In-Sync NT device can monitor and measure: phase voltage/phase and frequency of the genset and the mains, status of the mains and the load, calendar and device clock and much more information. Simply press  to view the information and the following screens will be displayed in sequence.



The following appear on the display: unit frequency, phase-neutral voltage and phase-phase voltage of the unit, (in this case they are 0 as the unit is stopped)



Generator phase by phase current value.



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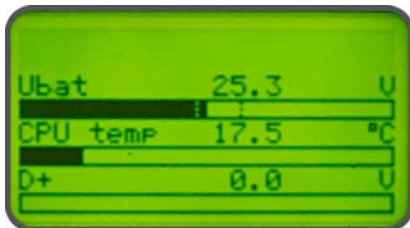
Bus frequency, phase-neutral voltage and phase-phase voltage of the bus (the BUS is the downstream system of the machine circuit breaker).



Current to Earth value (optional).



Active power, power factor, reactive power and apparent power of the unit for each phase.



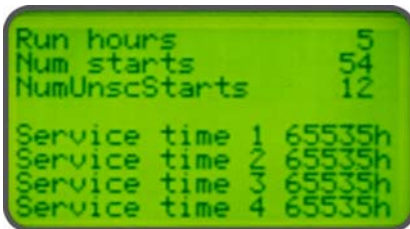
Battery voltage, control board temperature, voltage D+ (alternator battery charger).



Values of additional external sensors (optional).



Phase displacement of the unit with respect to the bus, its graphical display via the synchroscope; unit voltage and bus voltage, value in V of the engine speed adjustment signal and the percentage of the alternator voltage adjustment.



Unit operating hours, number of start-ups, number of failed start-ups, hours left for the first, second, third and fourth scheduled maintenance.



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kW/h, kVA/h produced by the unit, date and time.



Unit priority (in the case of multiple machines in parallel), total power available, total power reserve and binary information.

All the above-mentioned information is displayed starting from PAGE 1 and pressing the or keys. Other pages are available and can be used.

NOTE: if the display backlight is off, this will light up when any key is pressed. The commands will be implemented when the key/s are pressed again.

Press to return to the main menu. A menu will appear on which the cursor can be moved: select the desired row and press ENTER (Figure 3).



Figure 3: Selection menu

3.3. Alarm List

The third page (Figure 4) displays the list of events saved by the In-Sync NT. All the operations carried out by the equipment or the alarms it has detected can be reconstructed.

No.	reason
▶ 0	Fls water temp
1	Fls oil press
2	Switched on
3	Fls water temp
4	Fls oil press
5	Switched on

118	Sd min oil level
11:42 : 10	27/04/04

Figure 4: page 3

3.4. Measurement

This is page 1 (

Figure 2), described in Paragraph 3.1 on page 7.

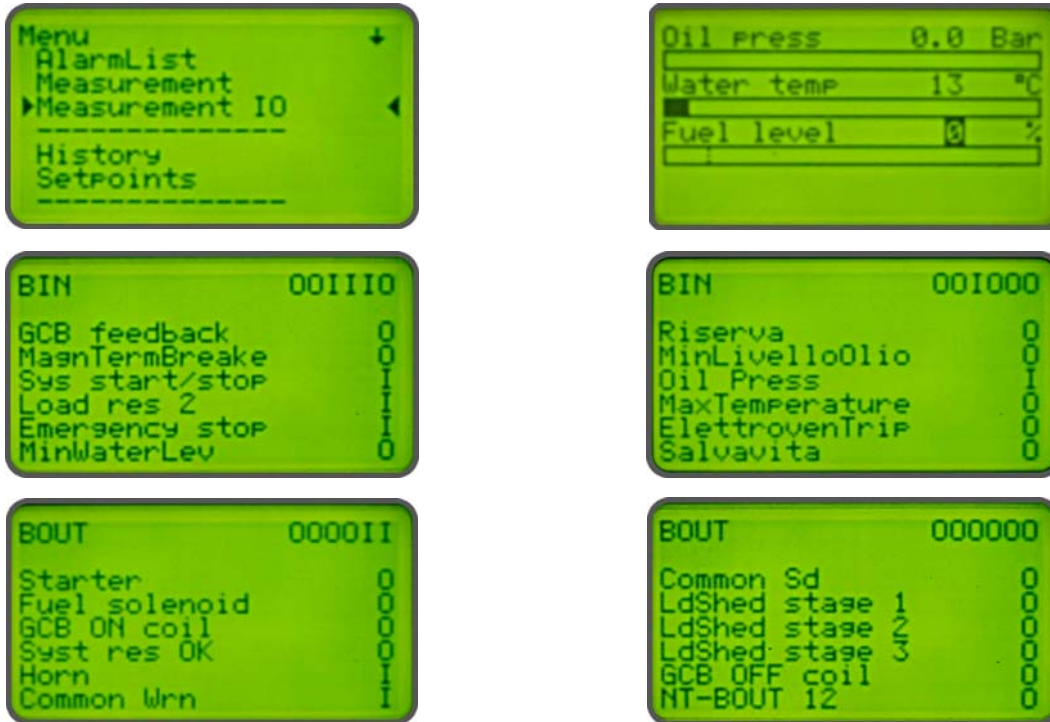


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3.5. Measurement I/O

This menu item displays the status of all inputs and outputs. The relative indicative screens are shown below in sequence.

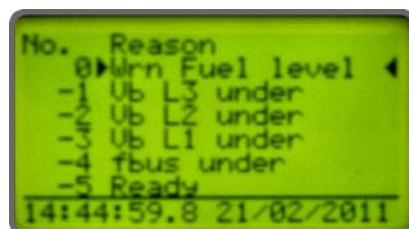


3.6. History

The In-Sync NT control unit logs all the events and operations it performs automatically and every external command. These are accessed from the "History" menu



Examples are provided further on. The logged date and time are indicated for each event. Those in the example below refer to the cursor position that indicates a diesel low level pre-alarm.



Press to display the status of all the inputs and outputs when the event occurred. Press ESC to return to the main Menu.



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3.7. Setpoints

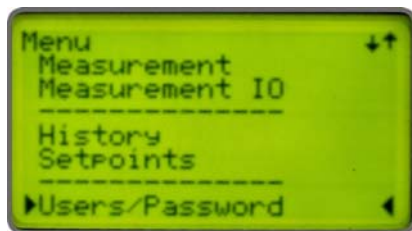
The figures below show how the "Setpoints" screens are accessed.



This part of the menu is mostly dedicated to trained technicians who know how the system works. However, it can be accessed freely, but the parameters can only be changed if a password is entered. Therefore, everything is visible but not everything can be modified. A few examples are found in Paragraph 3.9 on page 3.

3.8. Users / Password

The figures in this paragraph indicate the screens relative to entering the passwords.



The password must be different for each type of user:

- OPERATOR The default password for the operator is **301**. This password allows the MODE keys to be released for the unit mode to be toggled between MAN and AUTO
- DEALER This is reserved for the dealer called for maintenance purposes.
- OPERATOR
- VISA OPERATOR This is reserved for the VISA technician to perform adjustments that affect machine operation.



3.9. Example of how to modify parameters using the password

All the parameters of the In-Sync NT device are at different protected levels of the menu, access to which is protected by 3 passwords. Some of these parameters can be password-free: namely, the first level of protection is accessible to the customer operator, by entering the password: **301**.

**DANGER:**

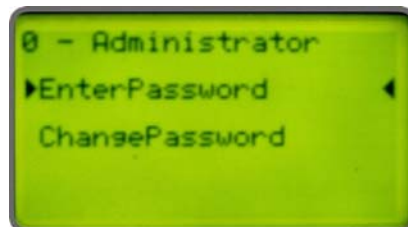
The parameters must only be modified by trained personnel.

Follow the steps below to access the editable SERVICE TIME parameters:

- Press to view the menu on the display.
- Move the cursor on to USERS/PASSWORD using the key.
- Press for the screen below to appear:



- position the cursor on OPERATOR and
- press for the screen below to appear:











- A number (zero) will appear when is pressed.
- Press the yellow key until number 301 is reached (keep the key pressed for the number to advance quickly).
- Confirm by pressing .
- Press to exit and return to the menu.
- Position the cursor on the desired menu item, e.g. "Engine protect".
- Press .
- Position the cursor on the "SERVICE TIME" value (next scheduled maintenance) to be set (1, 2, 3 or 4).
- Press .
- Edit the value of the next interval (in hours) to be set using and .
- Confirm by pressing .
- Exit by pressing until the main menu is reached.
- Select MEASUREMENT and press ENTER to return to PAGE 1.



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Setting the date and time:

- Press  to view the menu.
- Position the cursor ▶ on SETPOINTS.
- Press .
- Move the cursor ▶ on DATE/TIME.
- Press .
- Adjust the date and time using the  and  keys.
- Press  to confirm the change.
- Press  to return to the menu.
- Position the cursor on MEASUREMENT.
- Press  to return to PAGE 1.

NOTE: The In-Sync NT device always returns to PAGE 1 once 3 minutes elapse after the last key is pressed.



4. Operating configurations

The following cases are illustrated for simplicity's sake, considering two generating sets or one generating set and the mains. Similar applications are possible with a maximum of 32 units in parallel.

A current transformer (CT) must be installed for applications in parallel with the mains, which detects the current to and from the mains. This must be placed on phase n° 3; placing the CT on a different phase causes a reading error of the $\cos\phi$ and therefore the power also.



Specific regulations govern PRE system configurations, consisting of the genset in parallel with the mains, which regulate this possibility and depend on the local electric utility provider. The local regulations may impose the installation of appropriate devices that interface with the mains; the customer is obliged to verify that such requirements are met.

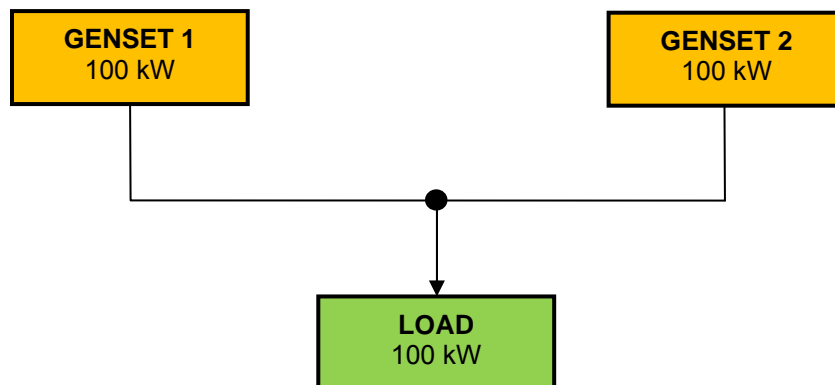
4.1. PGE910 load sharing configuration

This allows the load to be powered simultaneously by two or more units connected in parallel with no synchronisation with the mains.

The absorbed load is divided equally between them (50% in the case of 2 units). Example: a customer with a load of 100 kW that can never have power interruptions. A solution could be 2 x 100 kW units (or higher, depending on the type of load), connected in parallel and always on. The failure of one does not suspend the supply since the second unit supplies all the energy required. This solution also allows routine maintenance to be performed on one generating set at a time, without interrupting the power supply. The fuel consumption increases but the risk of voltage dips decreases significantly.

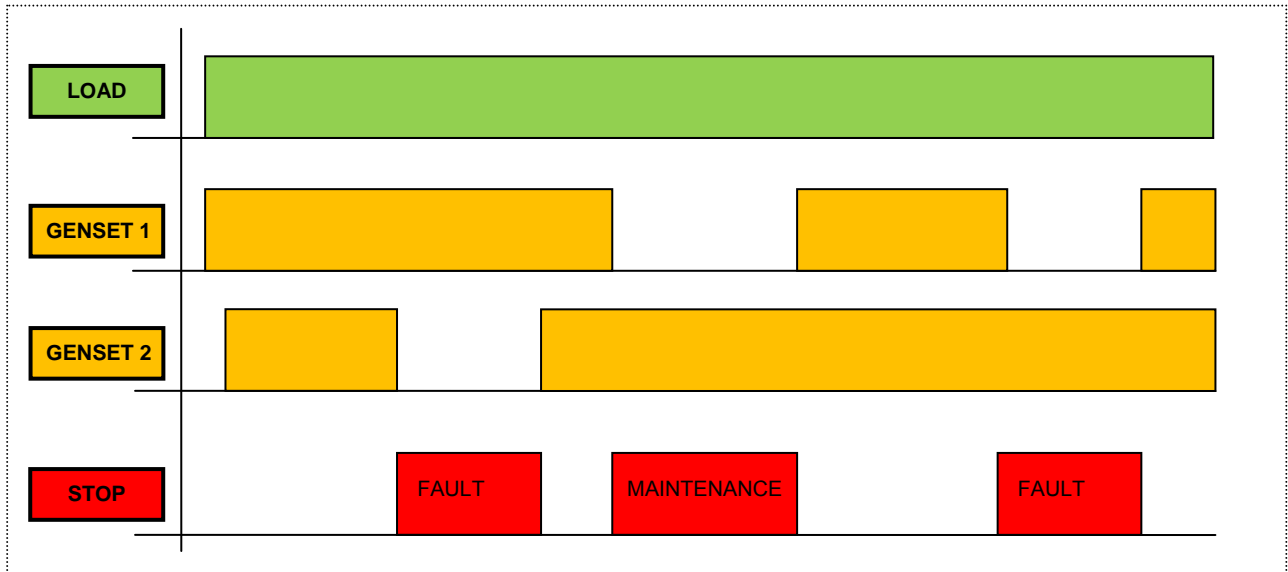
Examples:

- Important public events, with no mains power supply.
- Telephone, television and radio repeaters installed in remote areas, with no mains power supply.
- Critical applications.





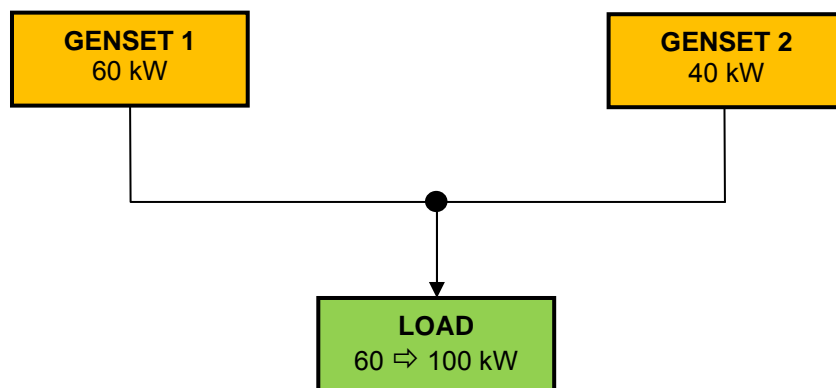
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Note how the load is always powered despite interrupted operation of the two units, caused by a fault or a programmed stop, such as maintenance.

This method can also be used if a customer already has a generating set (e.g. 60 kW) and has a larger load to power that exceeds the nominal power of the unit used (60 to 100 kW). Instead of buying a 100 kW unit, a second unit can be supplied whose power is equal to the increase in load (40 kW). The *Load sharing* application allows the power to be distributed proportionally to the nominal power of the units.

In this case, when operating at maximum load, if a fault should occur in one of the two units, there will be an overload in the second unit. In this case, special functions of the In-Sync NT are used to transmit a partial load release command. Even if the units are switched off for routine maintenance to be performed, a load reduction is required.



	<p>This application must be designed and approved by a Visa spa technician and is provided in this manual for the information to be complete. In this case, the In-Sync NT device must only be programmed by Visa technicians.</p>
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IN-SYNC NT



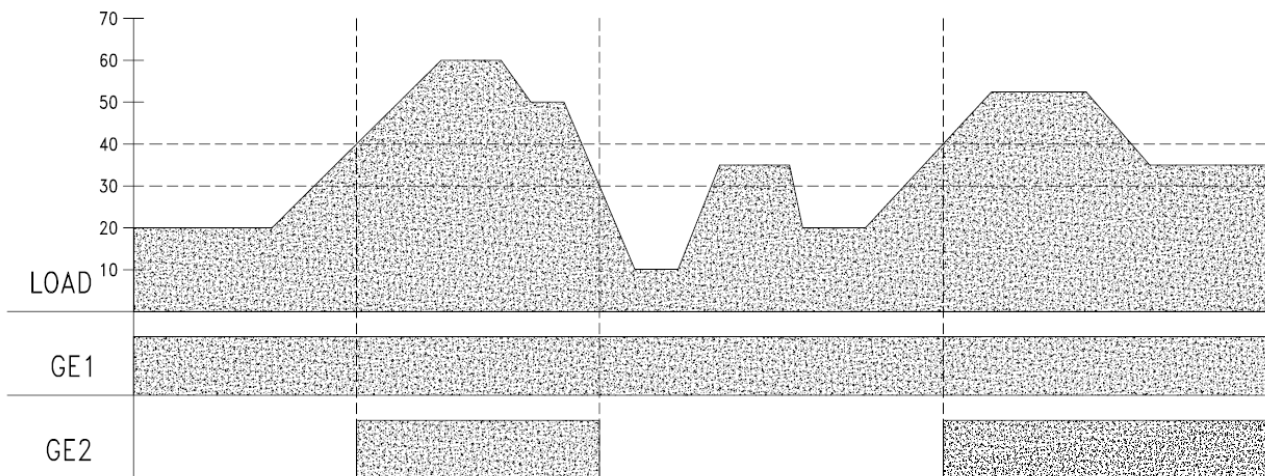
4.2. PGE920 load management configuration

The consumption of the generating set is optimised to use around 75% of the nominal power. One or more units can be switched off during low load periods (e.g. at night) in the case of loads with broad and slow variations.

The load management function allows automatic start-up and shutdown limits of the units to be set according to the load variation. The start-up/shutdown of the units can also be controlled manually or via external automatic systems.

The order of priority of operation can be set manually or automatically according to the operating hours of the units (uniform wear of the machines).

Important note: the unit requires a variable time within the 40 second range to start-up and synchronise itself (depending on the type of unit). It is important that the load is not increased much during this interval so as not to overload the running genset.



Where:

- LOAD Load performance
- GENSET 1 Start-up/shutdown of the 1st unit
- GENSET 2 Start-up/shutdown of the 2nd unit

This example represents the operation of two units, according to the load applied. Note how unit n°2 (GENSET 2) starts-up when the set value of 40 kW is exceeded and shuts down when the value drops below 30 kW.



This application must be designed and approved by a Visa spa technician and is provided in this manual for the information to be complete.
In this case, the In-Sync NT device must only be programmed by Visa technicians.



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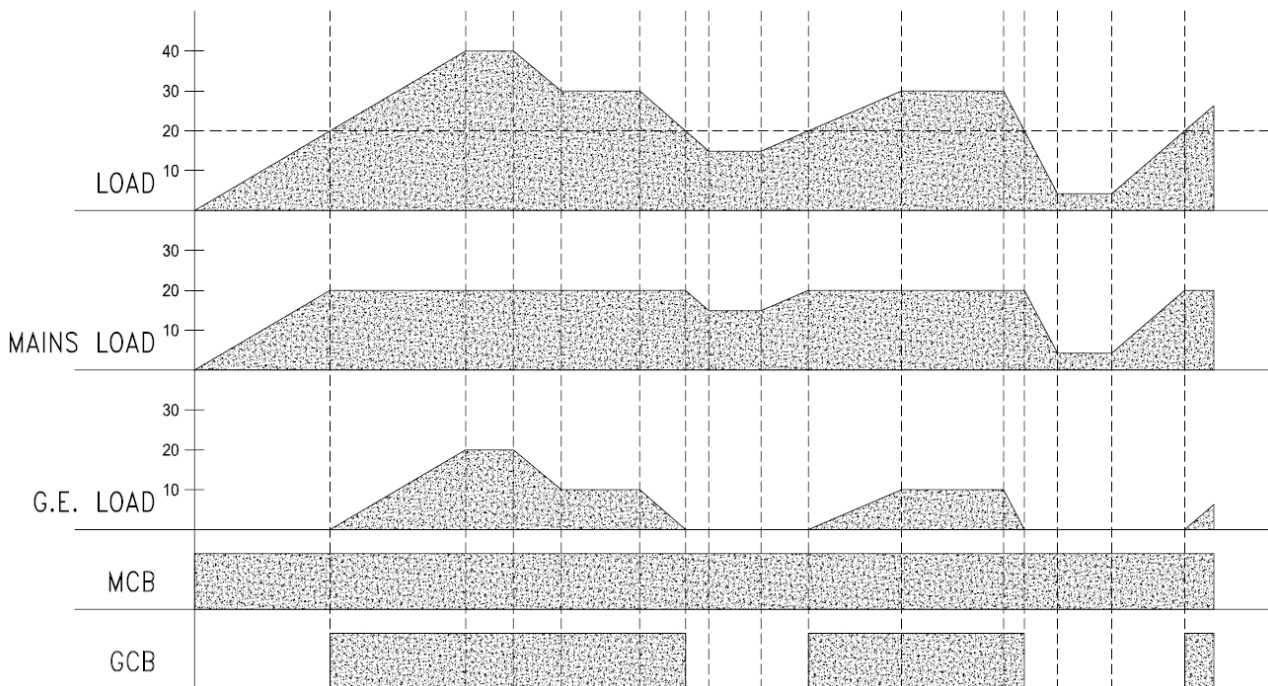
4.3. PRE910S import parallel with the mains configuration

This option allows the customer to connect his load to the mains, setting a maximum absorbed power limit. Once this is exceeded, the generating set starts-up in parallel with the mains, powering the excess load. This allows the customer to avoid sanctions or disconnections from the mains due to overloads.

The genset can also be kept constantly on, ready to make up for variations or started-up once the pre-set load threshold is exceeded. The board automatically detects the power failure and intervenes by opening the circuit breaker interfaced with the mains (MCB), thereby blocking the power supply to the mains.

The *Sys Start/stop* contact must be kept closed for the genset to always be used in parallel with the mains.

The *process control/import* parameter defines the load that will be absorbed from the mains and the rest of the load will be supplied by the genset.



Where:

LOAD	Load performance
MAINS LOAD	Performance of the load absorbed from the mains
GENSET LOAD	Performance of the load supplied by the unit
MCB	Status (open/closed) of the mains circuit breaker
GCB	Status (open/closed) of the unit circuit breaker

Since the genset reacts slowly to the load variations with respect to the mains, the load fluctuations are always met by the mains. The genset reacts to a variation in load with a delay of a few seconds, thereby bringing the absorbed power back to the set value.

The load can also be controlled with the genset switched off (*SysStart/Stop* contact open) and the *peak autostart* option activated. In this case, hysteresis thresholds must be set for the start and stop functions of the generator so as to prevent frequent start-ups due to load fluctuations.



This application must be designed and approved by a Visa spa technician and is provided in this manual for the information to be complete.
In this case, the In-Sync NT device must only be programmed by Visa technicians.



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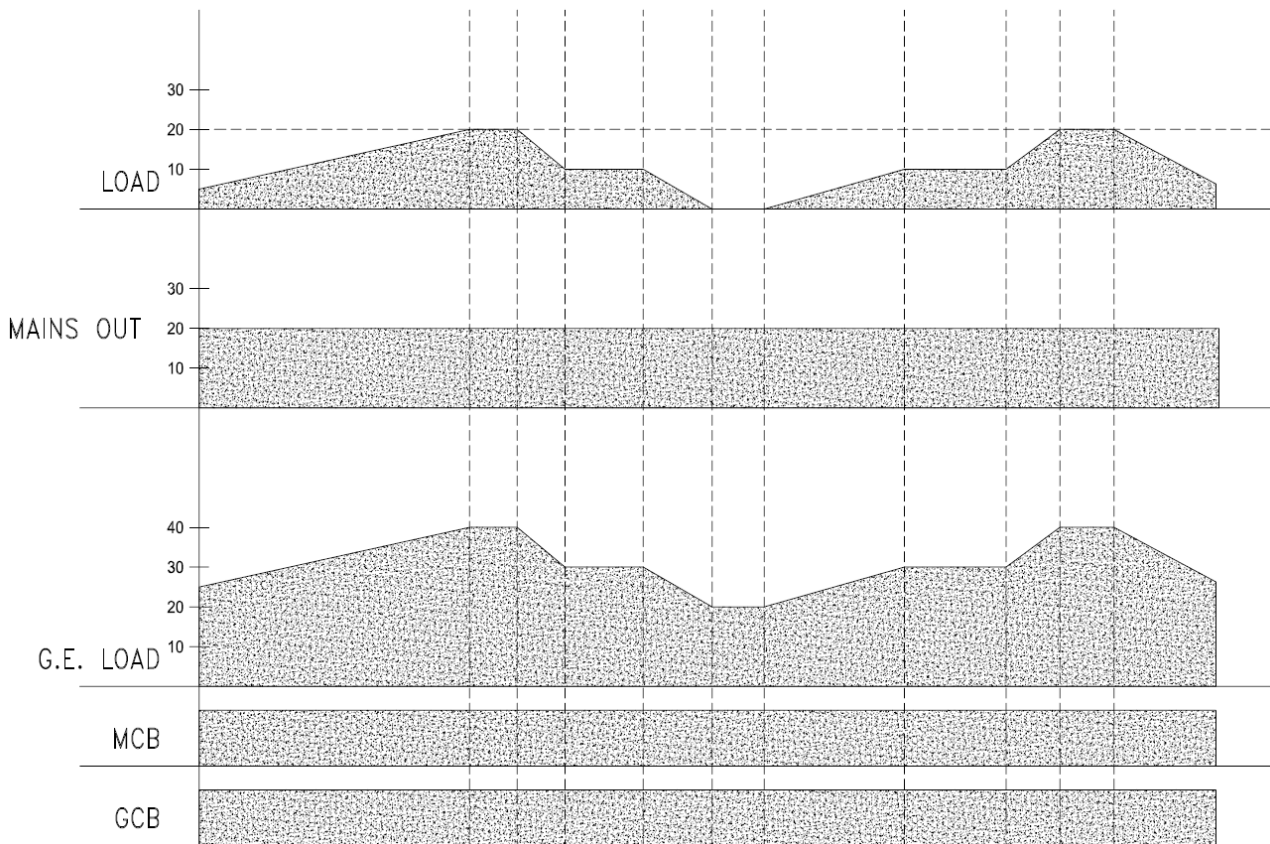


4.4. PRE920S export parallel with the mains configuration

This option allows the genset to run, supplying the mains with constant power whilst powering the load simultaneously. This way, the genset produces all the energy absorbed by the load together with the amount that is to be supplied to the mains.

The In-Sync NT board automatically detects a power failure and intervenes by opening the circuit breaker interfaced with the mains (MCB), thereby blocking the power supply to the mains. It will then continue to power the load. When the power is restored (with a programmable delay), it will synchronise with the mains and resume the supply.

This is achieved by keeping the *SysStart/Stop* contact closed and setting the load value to be exported in the *Process control/import* parameter. The value will be entered as "negative" to indicate to the board that the power is outgoing.



Where:

LOAD	Load performance
MAINS OUT	Performance of the load supplied to the mains
GENSET LOAD	Performance of the load supplied by the generating set
MCB	Status (open/closed) of the mains circuit breaker
GCB	Status (open/closed) of the unit circuit breaker



This application must be designed and approved by a Visa spa technician and is provided in this manual for the information to be complete.
 In this case, the In-Sync NT device must only be programmed by Visa technicians.



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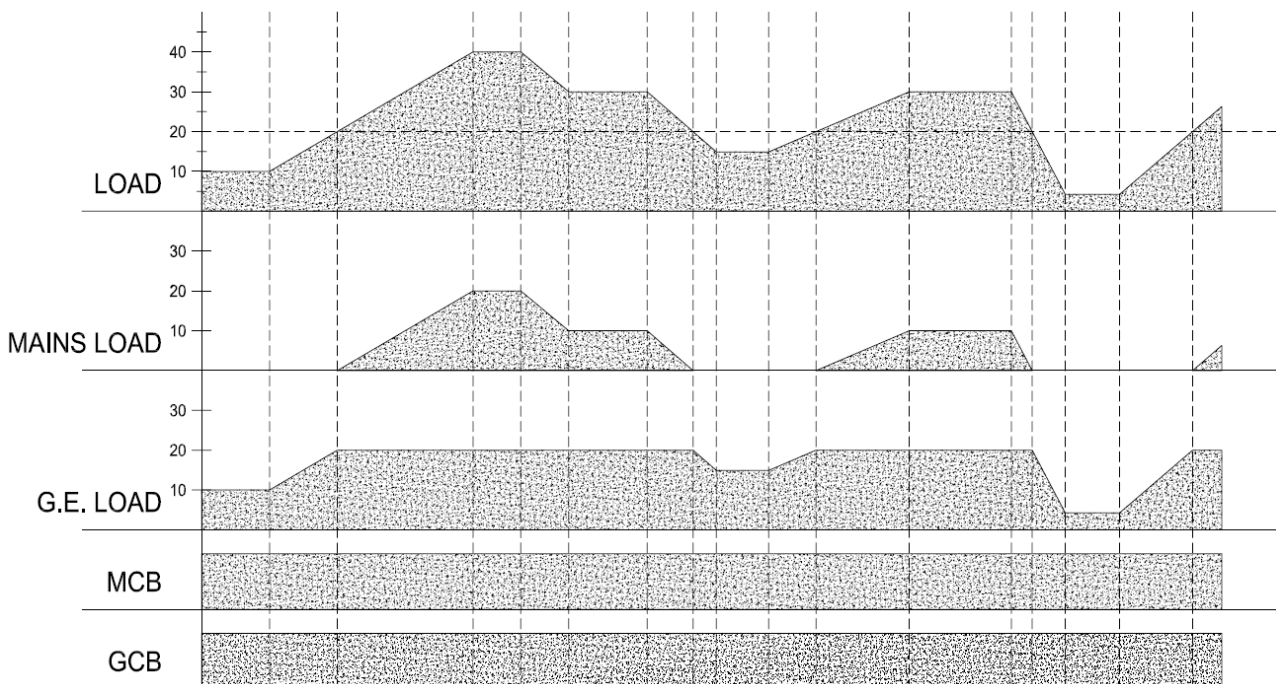
4.5. PRE930S base load parallel with the mains configuration

This option allows the genset to run for the prevailing supply of the load. As long as the load is less than the set power, it is powered solely by the generator; the excess will be supplied by the mains.

The board automatically detects a power failure and intervenes by opening the circuit breaker interfaced with the mains (MCB), thereby blocking the power supply to the mains. In this case, the *load shedding* contacts should be used, which allow non-priority loads to be released in case of an overload in the generator.

When the power is restored (with a programmable delay), it will synchronise with the mains and resume the supply.

Setting the value of the power to be exported in *Process control/base load*, the unit will supply energy up to the set value and the rest will be supplied by the mains.



Where:

- LOAD Load performance
- MAINS LOAD Load absorbed from the mains
- GENSET LOAD Load supplied by the generating set
- MCB Status (open/closed) of the mains circuit breaker
- GCB Status (open/closed) of the unit circuit breaker



This application must be designed and approved by a Visa spa technician and is provided in this manual for the information to be complete. In this case, the In-Sync NT device must only be programmed by Visa technicians.



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4.6. Automatic remote control configuration

The basic version of the In-Sync NT device has an input for a voltage free contact called *SYS Start/Stop*. Close the contact for the In-Sync NT device to automatically start-up or shutdown the genset (in AUTO mode), managing the start-up times and circuit breaker on board the machine, whilst also turning the engine off automatically if a fault occurs.

The genset start-up can be controlled if a suitable device is connected to this input, which activates the opening and closure of the contact (e.g. clock, manual selector, power presence sensor, radio control, etc.).

Moreover, the In-Sync NT device provides a potential free contact for possible consent to the changeover switch panel (ATS). In this case, the mains detection must be carried out by an external device and suitable devices must be set-up in the user's system for the proper connection and disconnection of the electrical load

The remote controlled AUTO mode operating cycle is subject to the standard factory-set times, some of which are editable; see *Engine params*.

	ATTENTION: The engine starts-up immediately when the mode is switched to Auto with the remote contact closed.
---	---

Selecting the automatic mode

- Turn the device on by bringing the key to the I/ON position;
- Wait for the device to display page 1;
- Check that the top cursor is positioned on OFF (point 1, figure 2), otherwise, press one of the two MODE keys until OFF is reached;
- Check that the remote contact is open;
- Press MODE and bring the cursor on AUTO.

At this point, contact closure results in unit start-up, stabilising of the revs and closure of the circuit breaker on board the machine.

The key can also be removed when it is in the I/ON position

If a number of units are used, once the contact is closed (if connected in parallel to all the gensets), all of them will start-up and synchronise.

When the contact is opened, the genset opens the circuit breaker on board the machine, remains on for the cooling process and then goes off once the set time elapses (programmable).

Refer to the wiring diagram supplied with the genset for the numbering of the terminals and the activated inputs.

NOTE: The external contact must be potential free and the recommended section is 2.5 mm² for a maximum distance of 200 m (the circulating voltage at the top of the contact will be 12V or 24 V DC, depending on the electrical system of the engine). It is important that the wires are insulated from possible sources of interference.

Remote fault warning

The standard configuration of the In-Sync NT device is equipped with two potential free contact outputs; one for a cumulative warning of the pre-alarms (events that require attention but do not stop the machine) and another for a cumulative warning of the alarms (that stop the machine or prevent start-up).

Several other outputs/inputs can be programmed according to agreements reached with the Visa Technical Department.



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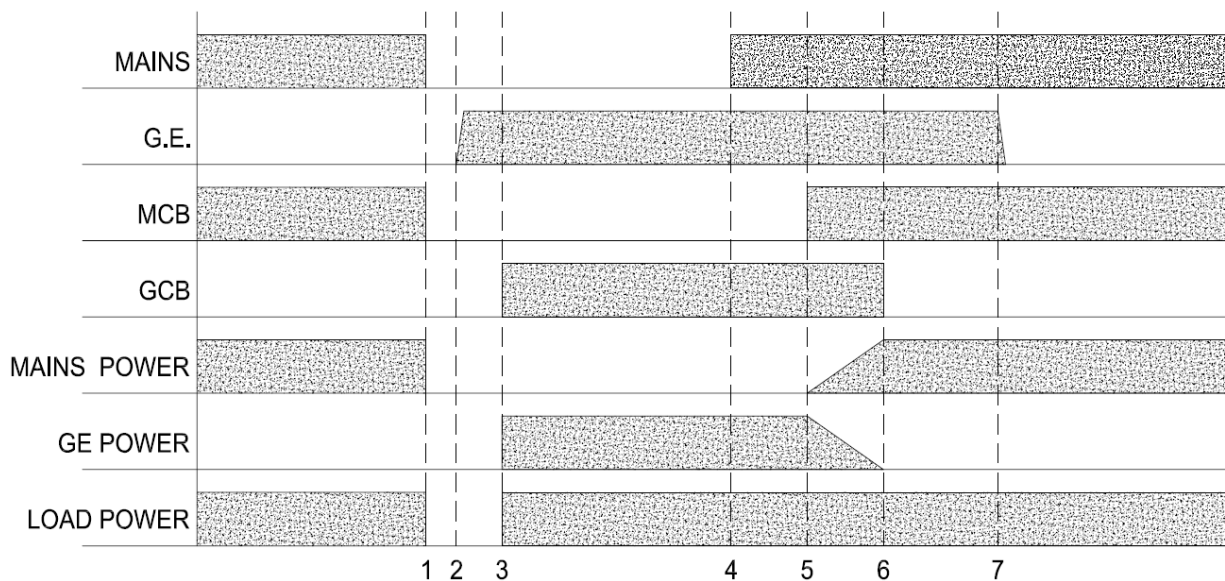
4.7. PRE940S configuration: automatic for SPTM mains emergency

The automatic for a mains emergency version of the In-Sync NT device (and short parallel with it when it is restored), allows a system to be controlled automatically according to a pre-set cycle, thereby causing the genset to start-up in the event of a power failure, powering of the user system and the shutdown of the genset once the normal conditions are restored.

The main advantage of using the In-Sync NT is that synchronisation can be implemented once the power is restored and the load can be gradually shifted from the unit to the mains without the typical voltage dip in changeover switch panels.

This function is activated by selecting the AUTO mode (see paragraph 2.1).

The following graph illustrates the temporal sequence of the events and operations.



Key:

- MAINS Mains presence
- GENSET Status of the generating set: start-up/shutdown
- MCB Opening/closing of the mains circuit breaker
- GCB Opening/closing of the unit circuit breaker
- MAINS POWER Power absorbed from the mains
- GENSET POWER Power supplied by the unit
- LOAD POWER Load consumption
- 1 Power failure, the mains circuit breaker opens
- 2 The genset starts-up after a pre-set delay (not to have untimely start-ups)
- 3 The unit circuit breaker is closed and the genset powers the load
- 4 Power supply is restored
- 5 The genset synchronises with the mains and closes the MCB after a programmable delay (to verify mains stability).
- 5-6 The load is gradually transferred from the unit to the mains
- 6 When the genset is unloaded, its circuit breaker opens: the entire load is powered by the mains.
- 7 The genset stops once the set cooling time elapses

Notes:

- a) A power failure occurs when the supply voltage exceeds the set minimum/maximum threshold or an asymmetry is detected for a period of time set in the mains out-of-range delay parameter.
- b) The engine start-up cycle is automatically repeated 5 times (can be set up to a maximum of 10). A pause takes place between one attempt and another in order to prevent the starter motor from



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- overheating. The start-up cycle in gensets equipped with pre-chamber engines (low power) is preceded by a start-up time of the spark plugs that lasts 11 s.
- c) The time that the engine takes to reach the nominal rotation speed depends on its size and characteristics and varies between 5 and 20 s. The device considers the engine as started-up when the signal deriving from the alternator battery charger has reached the expected value or the frequency of the main alternator of the genset has exceeded 20 Hz. After this time, the engine runs empty for 20 s; this time can be set but it is recommended not to set it to less than 10s.
 - d) The device controls the correct operation of the genset and protects the engine by shutting down automatically if faults should arise during operation.
 - e) The device starts counting the time the power supply takes to be restored as soon as the voltage values fall within the set thresholds. 60 s elapse before the load is switched to the mains in order to prevent a sudden changeover due to the possible instability of the values.
 - f) Mains presence is determined by the values falling within the set thresholds. The power is considered to be restored when the voltage values fall within the set thresholds less the fixed hysteresis. The hysteresis value is 4% for the voltage and 20% for asymmetry. E.g. if the maximum supply voltage out-of-range value is 435V (for a nominal voltage of 400V), the device considers the voltage within range when the value is less than 417.6 V.
 - g) If during the cooling time, another power failure occurs, the device immediately transfers the load to the genset once again.

The standard version of the gensets (PRE940S version) has been conformed to the international standard, which stipulates a system must have two circuit breakers: one installed on board the machine for the unit line (called GCB - *genset circuit breaker*), and another that acts as a mains interface (called MCB - *main circuit breaker*). The GCB is installed on board the machine in the standard supply, whereas the MCB is the mains master switch installed on the customer's system (not supplied by Visa).



5. List of parameters

The editing of the parameters allows the behaviour of the generating set to be adapted to the customer's specific requirements. Since modifications can have implications, which may even be dangerous for the system or the users (the unit starting-up unexpectedly), it is important to be aware that the operation must be solely carried out by trained personnel.

Do not change parameters unless you have specific knowledge about them or have received precise instructions. If still in doubt after having consulted the following paragraphs and the Comap manual, contact a VISA technician or the nearest authorised service centre.

Password-free parameters

These are the most commonly used parameters and are not password-protected in the standard setting.

Parameter	Description
Next service time	Time left (in hours) for the next scheduled maintenance. The first genset maintenance is scheduled after 50 operating hours. The subsequent intervals depend on the requirements provided by the manufacturer of the engine and the operating conditions. Consult the User Manual of the engine delivered together with the genset.
Date / Time	The internal clock is used for the alarms log; the occurrence date and time is logged for each event.

First level password-protected parameters

These are parameters that allow a customised installation and are to be modified by trained personnel.

Parameter	Description
Nominal Voltage	Modifies the nominal voltage of the genset; the output voltage in units operating in parallel must be the same on all the gensets. The maximum adjustment range is +/- 5V
Max Crank Time	Maximum starter motor connection; it may need to be extended by a few seconds in cold countries
Cooling Time	Cooling time before shutting down; the default value is 120 s
Gen > Volt	Generator maximum voltage protection threshold. If the detected voltage at the terminals of the alternator exceeds this value, the unit is stopped.
Gen < Volt	Generator minimum voltage protection threshold. If the detected voltage at the terminals of the alternator drops below this value, the unit is stopped.
Priority	Priority of use of the genset. The units with less priority (a higher number) in a PGE920 with load management configuration, will be the first to stop to decrease the load.




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














Example of editing the parameters

All the parameters of the In-Sync NT device are at different protected levels of the software menu on page 2, access to which is protected by 3 passwords. Some of these parameters can be password-free and the first protection level is free for the customer by entering the password: **301**.

Follow the steps below to access the user menu:

- press  for the screen below to appear:



- move the cursor  to the users/password row by pressing the  key
- press  for the three options: VISA OPERATOR, DEALER OPERATOR and OPERATOR to be displayed
- position the cursor  on OPERATOR
- press 
- a number (zero) will appear on the right
- press the  key until number 301 is reached (keep the key pressed for the number to advance quickly)
- press  to confirm and then  to return to the menu
- position the cursor on the desired submenu, e.g. on *setpoints* to edit the "nominal voltage"
- press 
- position the cursor on *basic settings* and then press  to confirm
- position the cursor on *nominal voltage* and press 
- set the desired value using  and  and confirm by pressing 
- press  to return to the menu
- select *Measurement* to return to the standard page or wait for the automatic exit.

Note: the In-Sync NT device always returns to page 1 once 3 minutes elapse after the last key is pressed.



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6. Connecting to a personal computer (optional)

The In-Sync NT can be connected directly to a PC with an RS232 interface via an RS232 serial crossover cable. Refer to the relative manual for further information regarding the installation and use of the software.

Two main programmes are available: *GenConfig* and *Intellimonitor*.

The *Intellimonitor* programme must be installed on the PC (direct connection or via modem), based on the Windows platform.

This allows the genset to be monitored remotely with the following functions:

- the values detected by the control unit read remotely;
- viewing the alarms log;
- engine control;

The second programme, *GenConfig*, is used to modify the configuration of the board to add or modify logic functions or editable inputs

- viewing and modifying the configurations;
- selecting the configuration software;
- modifying the settings of inputs and outputs;
- modifying passwords, command protection;

If the connection distance between the PC and the genset exceeds 5 m, interface boards to Ethernet, GSM or other networks are available, which allow the genset to be monitored from one or more points located anywhere in the world.

The In-Sync NT keeps track of each event in the historic archive, which can save up to 117 records. The older records are deleted when the archive is full.

If the PC is connected to the control unit and the log is loaded, the list can be viewed at a later stage or sent via e-mail for assistance purposes.

Configuration files can also be sent to or received from the assistance centre.



7. Troubleshooting

This chapter covers problems and possible solutions related to the generating set and the control device installed in the electrical panel on board the machine.

	<p>ATTENTION</p> <p>Do not perform or engage in maintenance, repairs or alterations without having specific knowledge or precise guidelines.</p> <p>All the operations must be performed in compliance with the safety standards.</p> <p>If still in doubt after having consulted the following paragraphs and the engine manual, contact a VISA technician or the nearest authorised service centre.</p>

If a fault occurs, the control unit stops the genset storing the reason in the memory and the genset cannot be restarted until the operator performs a manual reset by pressing the key. When a FAULT occurs, read the message on the display, consult the manual and identify and save the fault and the cause before pressing . Do not restart the genset without having assessed and resolved the fault.

	<p>ATTENTION:</p> <p>If the cause has not been resolved, do not reset or repeat the start-up cycle, especially if ALARM = MOTOR OIL LOW PRESSURE appears on the display.</p>
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NOTE: the In-Sync NT device enables the alarms 20 s after the engine is started-up. From the start-up command up to this time the engine runs with no protections; therefore, if there are problems in the lubrication circuit and **the start-up cycle is repeated several times, this can cause significant damage to the engine.**

Do not touch the electronic components on the printed circuit of the In-Sync NT board with bare hands. There may be dangerous voltages even with the unit switched off and damage may be caused due to electrostatic loads.

Electrical panel

Problem	Probable causes	How to intervene
The device does not go on	Disconnected/flat battery Blown fuse Interrupted power supply circuit (circuit breaker-key)	Check the fuses inside the panel, the key contact closure and the battery voltage.
The device goes on but the display is off	Display contrast is not correct. The display is defective	Adjust the contrast by pressing and . Contact the service centre
Circuit breaker does not close	Release coil fault Circuit breaker engine fault Incorrect electrical parameters V/Hz	Verify the voltage and frequency Contact the service centre

Problems signalled by the In-Sync NT device



The In-Sync NT control unit checks many parameters of different importance or criticality; for this reason the alarms are of different importance. All the active “alarms” appear on the display and trigger the buzzer.



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The correct way of interpreting the information is to:

- Silence the buzzer by pressing the  key. Pause.
- If the alarm is still active, it is immediately displayed as a description with no operation being required.
- Take note of the alarm even if it seems easy to understand (a photo with a mobile phone, paper and pen).
- If it is easily understood, e.g. “Stp min coolant level”, resolve the problem by adding antifreeze to the radiator (in this case) and then press  to clear the alarm.
- If the message is difficult to understand, contact the nearest service centre, clearly reporting the type of alarm displayed.

The types of alarm are:

- **Wrn**: *warning / pre-alarm*; this does not stop the machine but only signals the alarm. The In-Sync NT is indicating a fault that is not hazardous to the unit or people. The unit can operate normally but must be checked.
- **FIs**: *Fail sensor*; this does not trigger “actions”. The In-Sync NT is indicating a sensor malfunction that is not hazardous to the unit or people. The unit can operate normally but it is best to check the sensor (usually pressure or temperature related).
- **Stp**: *engine slow stop*; this causes the engine to stop (after cooling) and the machine circuit breaker to open. This is a relatively important type of alarm but not enough to immediately stop the unit. In fact, the engine cooling cycle is performed.
- **Sd**: *Shut down*; “immediate stop alarm” causes the circuit breaker to open and the engine to stop IMMEDIATELY; e.g. “Sd emergency button” appears if the emergency button is pressed. This is due to a potentially hazardous situation for the unit and people.
- **BOC**: *Breaker open*; this is an open circuit breaker alarm, which is valid for all the electrically-related alarms with a precautionary solution to open the circuit breaker. The engine stops after the cooling cycle.

Messages may not appear in the list due to customisations and certain events that normally generate a *warning* can be configured to generate a *Shutdown* and vice versa

The most common pre-alarm messages

Warning / pre-alarm messages	Meaning/causes	How to intervene
Wrn - Fuel Min Level	Fuel reserve (if a sensor is connected)	Top-up the fuel
Wrn - Service Time	The engine mechanical maintenance interval has elapsed	Perform maintenance on the engine and set the new interval (about 250 hours)
Wrn - Battery Flat	The battery/ies are flat or in any case, below the set minimum voltage level	Verify that the engine and static (if installed) battery charger works. Check the battery fluid level.
Stp - Stop Engine Fail	A fault in the engine stop; the engine stop device (solenoid valve – electromagnet) does not work	Check the electrical connections Request technical assistance.
Sd - Low Gen Volt	Emergency stop due to low voltage in the generator	Use a tool to measure whether the alternator generates voltage or whether the In-Sync NT does not “read” well. Check the fuses, generator, AVR and connections. Request assistance.
Sd - High Gen Volt	Emergency stop due to high voltage in the generator	Check the generator, AVR and connections. Request assistance.



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Warning / pre-alarm messages	Meaning/causes	How to intervene
BOC - Gen Unbalance ph 1.2.3	Circuit breaker is opened due to unit voltage asymmetry	Check the load and divide it equally on the three phases
Stp - Cb Fail	Engine slow stop due to a fault in the alternator battery charger	Check the belt Check the alternator battery charger Check the wiring
FIs - Oil Press	Watch out for a fault in the analogue oil pressure sensor	Check the oil level Check the electrical connection Replace the sensor
FIs - Water Temp	Watch out for a fault in the analogue temperature sensor	Check the coolant Check the electrical connection Replace the sensor

The most common alarm messages

Alarm / fault messages	Meaning/causes	How to intervene
STP Min coolant level	Engine slow stop due to insufficient radiator liquid	Top-up and check for any leaks; Replace the sensor.
STP High Temp	Overheated engine Check the liquid level Check the belts Check the cleanliness of the radiator Check the environmental temperature Check the engine temperature Check the electrical load Check the sensor	Top-up Replace and tighten the belts Clean and perform maintenance Check the air inlets Check the coolant temperature on the relative instrument. Check the electrical load and decrease it Replace the sensor
Failed Start-up	Defective start-up system Defective fuel system	Check the starter motor Check the fuel, fuel filters, electrical connection and shutdown device.
Blocked electric fan	Check the thermal protection of the electric fan Check the electrical connection	Verify what triggered the thermal protection



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Error messages

This table describes the error messages that can be signalled by the In-sync NT board

A: displayed as an alarm

H: saved in the log

Message	Description
BIN 1-12 ANA 1-10 BOUT 1-12 AOUT 1-4 A+H	Indication of a communication error in the additional inputs expansion module. Check: <ul style="list-style-type: none"> - that the expansion with the corresponding address is powered correctly - that the connections are correct and the terminating resistors are installed correctly - that the can-bus connection wires are not inverted Check the Tx and Rx LEDs of the can-bus port to verify that the module communicates correctly. If they flash rapidly, communication is correct.
ECU A+H	Communication error with the ECU of the engine. Check <ul style="list-style-type: none"> - the connections of the CAN1 port to the engine control unit - verify the terminating resistors and the power supply - that the can-bus connection wires are not inverted
SHBIN 1-4 A+H	Communication error with the SHBOUT modules 1-4. Check <ul style="list-style-type: none"> - that one of the internal controllers is configured as SOURCE (its module configured as SHBOUT (x)) - that the controller is powered - that the <i>target</i> and <i>source</i> controllers are connected to the CAN2 port and the Tx and Rx LEDs of the CAN2 port flash - the CAN16/32 values in the power management screen (each control signals 1 in the position marked by its own address). - The CAN2 connection must conform to the <i>IGS-NT installation guide</i>. See the <i>Recommended Can/RS485 connection</i> Chapter.
SHAIN 1-4	Communication error with the SHAOUT modules 1-4. Check <ul style="list-style-type: none"> - that one of the internal controllers is configured as SOURCE (its module configured as SHAOUT (x)) - that the controller is powered - that the <i>target</i> and <i>source</i> controllers are connected to the CAN2 port and the Tx and Rx LEDs of the CAN2 port flash - the CAN16/32 values in the power management screen (each control signals 1 in the position marked by its own address). - The CAN2 connection must conform to the <i>IGS-NT installation guide</i>. See the <i>Recommended Can/RS485 connection</i> Chapter.
SHBinCfgErr1 A	Configuration error of the shared Binary modules - e.g. more than one source module (SHBOUT) has been configured on the CAN2 bus. Make sure there is only one configured SHBOUT(x) module.
SHAINCfgErr1 A	Configuration error of the shared Binary modules - e.g. more than one source module (SHAOUT) has been configured on the CAN2 bus. Make sure there is only one configured SHAOUT(x) module.
PLC State 1 PLC State 2 PLC State 3 PLC State 4 A	Status indicator of PLC 1, 2, 3 or 4 (for more information, please see the description of Force protect PLC function)



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Message	Description
ActCall Fail A	Indication that a call failed. Refer to the <i>IntelliCommunication Guide</i> to check the modem/internet connection and the call activation setting
ECUdiagBlocked A	Alarm is active when Comms settings : <i>ECU diag</i> = DISABLED. This means that the ECU alarms are not displayed or considered by the board. This is the notification message
Wrong config A+H	Incorrect board configuration: indicates that the board hardware does not support the PLC used in the configuration. Send the IDch and DNGL codes read on the information page 2 to the technical support.
RTCbatteryFlat A	This message indicates that the backup battery of the board is almost flat. If the board is switched off when the battery is completely flat, all the parameter data and the events log will be lost. The battery must be replaced by a specialised technician.
Al/Hist. msg 1-16 A+H	This message can be used as a customised message for additional protection; it can be configured for each parameter inside the board. See <i>GenConfig manual - Protections</i> .
Batt volt A+H	Indicates that the genset battery voltage is beyond the set values. Analog protect : <i>Batt >V</i> , <i>Batt <V</i> , and <i>Batt volt del.</i> setpoints. Verify whether the alternator battery charger or the additional battery charger work correctly.
EarthFaultCurr A+H	Indication of current dispersion to Earth. This protection works in accordance with the parameters: Gener protect : <i>EarthFaultCurr</i> and <i>EthFltCurr del.</i> setpoints. See also parameter <i>EarthFltCurrCT</i> from the Basic settings .
Gen V unbal A+H	Indication of unbalanced generator voltage. See parameters Gener protect : <i>Gen V unbal</i> and <i>Gen V unbal del.</i> The unbalanced voltage is calculated as the maximum difference between the voltages of each phase.
Gen I unbal A+H	Indication of unbalanced current. See parameters Gener protect : <i>Gen I unbal</i> and <i>Gen I unbal del.</i> The unbalanced current is calculated as the maximum difference between the currents of each phase.
BusL I unbal A+H	Indication of unbalanced bus current See parameters Gener protect : <i>BusL I unbal</i> and <i>BusL I unbal del.</i> The unbalanced current is calculated as the maximum difference between the currents of each phase
Mains V unbal A+H	Unbalanced supply voltage See parameters: Mains protect : <i>Mains V unbal</i> and <i>MainsV unbal del.</i> The unbalanced supply voltage is calculated as the maximum difference between the voltages of each phase.
Mains I unbal A+H	Unbalanced mains current. See parameters: Mains protect : <i>Mains I unbal</i> and <i>Mains I unbal del.</i> The unbalanced mains current is calculated as the maximum difference between the currents of each phase.
Bus V unbal A+H	Unbalanced bus voltage. See parameters: Gener protect (Bus protect) : <i>Bus V unbal</i> and <i>Bus V unbal del.</i> The unbalanced Bus voltage is calculated as the maximum difference between the voltages of each phase
BusL V unbal	Unbalanced left bus voltage See parameters: BusL protect : <i>BusL V unbal</i> and <i>BusL V unbal del.</i> The unbalanced Bus voltage is calculated as the maximum difference between the voltages of each phase



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Message	Description
BusR V unbal	Unbalanced right bus voltage See parameters: BusR protect : <i>BusR V unbal</i> and <i>BusR V unb del</i> . The unbalanced Bus voltage is calculated as the maximum difference between the voltages of each phase
Dongle incomp A+H	Indication of an incompatible dongle. (usually missing) The IGS-NT-LSM+PMS dongle (green) must be present if the load sharing and power management functions are used in MINT, COX or COMBI. See the <i>Reference Guide</i> to verify when the dongle is required.
Emergency stop A+H	Emergency stop. Check the input with the emergency stop function
CAN2 bus empty A+H	This alarm is active if the control does not see any other control connected to the CAN2 bus. This alarm can be de/activated by using the following parameter: Comm settings : <i>CAN2emptDetect</i> . This parameter must be disabled in the genset application. Check the Reg16/Reg32 strings to see which boards are in the same unit.
ChrgAlternFail A+H	Indication of a fault in the alternator battery charger. This alarm means that the D+ voltage is less than 80% of the board supply voltage, which in turn means that the genset battery is not being charged. Check the operation of the alternator battery charger.
Sd Stop fail A+H	Indication of a failed engine stop, i.e. the engine does not signal its stopped state. See parameters: Engine params : <i>Stop time</i> . "stopped engine" conditions: <ul style="list-style-type: none"> - engine revs (RPM) = 0 - AI: Oil pressure < <i>Starting POil</i> and - Wire D+ is not active - BI: <i>RunIndication</i> 1 and 2 and 3 are not active - Generator voltage < 15V (in all phases) - Generator Frequency = 0 Hz If all these conditions are met, the engine stop status is confirmed after a 2 s delay.
Overspeed A+H	The overspeed alarm is adjusted via the following parameters: Engine protect : <i>Overspeed</i>
Underspeed A+H	See the following parameters for the underspeed alarm: Engine params : <i>Starting RPM</i> . This protection is active once the engine is started-up and the revs drop below the value set in <i>Starting RPM</i> For more information see the <i>Engine starting procedures</i> description in the reference guide.
Pickup fail A+H	Pickup failure alarm. This means that the signal deriving from the pickup does not arrive together with the <i>running engine</i> active status. Running engine condition: <ul style="list-style-type: none"> - engine speed > Engine params: <i>Starting RPM</i> or - AI: Oil press > <i>Starting POil</i> or - Wire D+ is active (this condition is only used if the Engine params: <i>D+ function</i>= enabled) or - BI: <i>RunIndication</i> 1 or 2 or 3 are active or - Generator voltage is > 15 V (in each phase). See <i>Speed pick-up input</i> Refer to the <i>Technical data</i> Chapter in the <i>IGS-NT-x.y.-Installation Guide</i> for information relative to the parameters of the pickup signals.



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Message	Description
Sd BatteryFlat A+H	This alarm is activated if the board goes back on after a drop in battery voltage caused by the engine being started-up (the voltage drops below 6 volt). The ComAp I-Lba module can help resolve this problem. For information see the <i>IGS-NT-x.y.-Installation Guide</i> .
WrnServiceTime A+H	This alarm is activated when at least one of the board service countdowns has reached zero. See parameters Engine protect: Service time X. A value other than zero must be set in the corresponding parameters for the message to be cleared.
Not lubricated A	This alarm remains active before the end of the first lubrication cycle. See the <i>Engine states</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Start fail A+H	This alarm is activated if start-up fails. This means that the board has performed all the start-up attempts set in the Engine params: Crank attempts but the engine has not started. For further information see the <i>Engine starting procedures</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Start blocking A	This message means that an input set as Startblocking is active and therefore, start-up is blocked. If the startblocking status is active, Notready is displayed in the list of alarms. As soon as the input is disabled the engine is enabled to start-up.
Wrn CylTemp1-32 A+H	The AI Cylinder temperature 1-32 thermal protection is active. Check the value of the corresponding threshold.
Wrn MCB fail A+H	Fault in the (MCB) mains circuit breaker. See the <i>Circuit breakers operation sequence, GCB/MCB fail detection</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Stp GCB fail A+H	Fault in the (GCB) generator circuit breaker. See the <i>Circuit breakers operation sequence, GCB/MCB fail detection</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Wrn BTB fail A+H	BTB (bus to bus) fault See the <i>Circuit breakers operation sequence, GCB/MCB fail detection</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Wrn MGCB fail	MGCB fault See the <i>Circuit breakers operation sequence, GCB/MCB fail detection</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Sd Oil press B A+H	Engine stopped by the input configured as low oil pressure. (see the LBI board in the GenConfig for information regarding the signal accepted for this function)
Wrn RSync fail A+H	Indication that the inverse synchronisation failed. The generator or set of generators has failed to synchronise with the mains within the time set in Sync/Load ctrl: Sync timeout . See the parameters of Sync/Load ctrl and Volt/PF ctrl . <i>Frequency regulation loop, Angle regulation loop and Voltage regulation loop</i> are active during synchronisation and they may have to be recalibrated. The current synchronisation status can be viewed on the measurements screen with the synchroscope, where: the speed, voltage adjustment, slip frequency, generator voltage and supply voltage can be read during the synchronisation process.



IN-SYNC NT



Message	Description
Stp Sync fail A+H	<p>Indication of a synchronisation error (timeout sync alarm is active); the generator or set of generators has failed to synchronise with the mains or Bus within the time set in Sync/Load ctrl: Sync timeout.</p> <p>See the parameters of Sync/Load ctrl and Volt/PF ctrl. <i>Frequency regulation loop, Angle regulation loop and Voltage regulation loop</i> are active during synchronisation and they may have to be recalibrated.</p> <p>The current synchronisation status can be viewed on the measurements screen with the synchroscope, where: the speed, voltage adjustment, slip frequency, generator voltage and supply voltage can be read during the synchronisation process.</p>
Wrn Sync fail A+H	<p>Indication of a synchronisation error (timeout sync alarm is active); the generator or set of generators has failed to synchronise with the mains or Bus within the time set in Sync/Load ctrl: Sync timeout.</p> <p>See the parameters of Sync/Load ctrl and Volt/PF ctrl. <i>Frequency regulation loop, Angle regulation loop and Voltage regulation loop</i> are active during synchronisation and they may have to be recalibrated.</p> <p>The current synchronisation status can be viewed on the measurements screen with the synchroscope, where: the speed, voltage adjustment, slip frequency, generator voltage and supply voltage can be read during the synchronisation process.</p>
BOC L1, L2 or L3 under A+H	<p>The voltage of generator L1, L2 and L3 is less than the value set in <i>Gen <V BOC</i> for a time equal to <i>Gen V del</i>. The undervoltage protections are adjusted via parameters <i>Gener protect : Gen <V BOC</i> and <i>Gen V del</i>. This alarm is displayed if the protection refers to the phase-neutral voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL. 19</p>
BOC L1, L2 or L3 over A+H	<p>The voltage of generator L1, L2 and L3 is more than the value set in <i>Gen >V BOC</i> for a time equal to <i>Gen V del</i>. The overvoltage protections are adjusted via parameters <i>Gener protect : Gen >V BOC</i> and <i>Gen V del</i>. This alarm is displayed if the protection is based on the phase-neutral voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL. 19</p>
Sd L1, L2 or L3 over A+H	<p>The voltage of generator L1, L2 and L3 is more than the value set in <i>Gen >V SD</i> for a time equal to <i>Gen V del</i>. The overvoltage protections are adjusted via parameters <i>Gener protect : Gen >V SD</i> and <i>Gen V del</i>. This alarm is displayed if the protection is based on the phase-neutral voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL. 19</p>
BOC L12, L23 or L31 under A+H	<p>The voltage of generator L12, L23 and L31 is less than the value set in <i>Gen <V BOC</i> for a time equal to <i>Gen V del</i>. The undervoltage protections are adjusted via parameters <i>Gener protect : Gen <V BOC</i> and <i>Gen V del</i>. This alarm is displayed if the protection is based on the phase-phase voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-PHASE.</p>
BOC L12, L23 or L31 over	<p>The voltage of generator L12, L23 and L31 is more than the value set in <i>Gen >V BOC</i> for a time equal to <i>Gen V del</i>. The overvoltage protections are adjusted via parameters <i>Gener protect : Gen >V BOC</i> and <i>Gen V del</i>. This alarm is displayed if the protection is based on the phase-phase voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-PHASE.</p>
Sd L12, L23 or L31 over A+H	<p>The voltage of generator L12, L23 and L31 is more than the value set in <i>Gen >V SD</i> for a time equal to <i>Gen V del</i>. The overvoltage protections are adjusted via parameters <i>Gener protect : Gen >V SD</i> and <i>Gen V del</i>. This alarm is displayed if the protection is based on the phase-phase voltage.</p> <p>Therefore, only if the parameter: <i>FixVoltProtSel</i> is set as PHASE-PHASE.</p>
BOC fgen under A+H	<p>The frequency of the generator is less than the <i>Gen <f</i> limit parameter for a time equal to <i>Gen f del</i>. The under-frequency protection is adjusted via parameters <i>Gener protect : Gen <f</i> and <i>Gen f del</i>.</p>
BOC fgen over A+H	<p>The frequency of the generator is more than the <i>Gen >f</i> limit parameter for a time equal to <i>Gen f del</i>. The over-frequency protection is adjusted via parameters <i>Gener protect : Gen >f</i> and <i>Gen f del</i>.</p>



IN-SYNC NT



Message	Description
BOC ReversePwr A+H	This alarm is triggered by the inverse power protection. This protection is adjusted via parameters <i>Gener protect</i> : Reverse power and <i>ReversePwr del</i> . This means that one of the engine speed regulators is not working properly or a current transformer is connected wrongly.
MP L1, L2 or L3 under A+H	The supply voltage L1, L2 or L3 is less than <i>Mains < V MP</i> for a time equal to <i>Mains V del</i> . The undervoltage protection is adjusted via parameters <i>Mains protect</i> : <i>Mains protect</i> : <i>Mains < V MP</i> and <i>Mains V del</i> . These alarms are displayed if the protection is set as phase-neutral voltage. In practice, Basic setting: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.
MP L1, L2 or L3 over A+H	The supply voltage L1, L2 or L3 is more than <i>Mains > V MP</i> for a time equal to <i>Mains V del</i> . The over-frequency protection is adjusted via parameters Mains protect : <i>Mains > V MP</i> and <i>Mains V del</i> . This alarm is displayed if the voltage protection is based on the phase-neutral voltage. This means that the parameter: Basic settings : <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.
MP L12, L23 or L31 under A+H	The supply voltage L12, L23 or L31 is less than <i>Mains < V MP</i> for a time equal to <i>Mains V del</i> . The undervoltage protection is adjusted via parameters <i>Mains protect</i> : <i>Mains protect</i> : <i>Mains < V MP</i> and <i>Mains V del</i> . These alarms are displayed if the protection is set as phase-neutral voltage. This means that Basic setting: <i>FixVoltProtSel</i> is set as PHASE-PHASE.
MP L12, L23 or L31 over A+H	The supply voltage L12, L23 or L31 is more than <i>Mains > V MP</i> for a time equal to <i>Mains V del</i> . The over-frequency protection is adjusted via parameters Mains protect : <i>Mains > V MP</i> and <i>Mains V del</i> . This alarm is displayed if the voltage protection is based on the phase-neutral voltage. This means that the parameter: Basic settings : <i>FixVoltProtSel</i> is set as PHASE-PHASE.
MP fmns under A+H	The mains frequency is less than <i>Mains < f</i> for a time equal to <i>Mains f del</i> . The under-frequency protection is adjusted via parameters: Mains protect : <i>Mains < f</i> and <i>Mains f del</i> .
MP fmns over A+H	The mains frequency is more than <i>Mains > f</i> for a time equal to <i>Mains f del</i> . The over-frequency protection is adjusted via parameters: Mains protect : <i>Mains > f</i> and <i>Mains f del</i> .
BusL L1, L2 or L3 under H	The left bus voltage L1, L2 or L3 is less than <i>BusLeft < V</i> for a time equal to <i>BusLeft V del</i> . The relative information will be saved in the board memory. The BusL protect parameter: <i>BusL Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged. The voltage must be more than <i>BusLeft < V</i> for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusL Volt prot</i> must be set to ENABLED) This alarm is activated if the protection is set to phase-neutral voltage. This means that the parameter: Basic settings : <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.



IN-SYNC NT



Message	Description
BusL L1, L2 or L3 over H	<p>The left bus voltage L1, L2 or L3 is more than <i>BusLeft</i> <V for a time equal to <i>BusLeft V del</i>. The relative information will be saved in the board memory.</p> <p>The BusL protect parameter: <i>BusL Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged.</p> <p>The voltage must be more than <i>BusLeft</i> <V for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusL Volt prot</i> must be set to ENABLED)</p> <p>This alarm is activated if the protection is set to phase-neutral voltage.</p> <p>This means that the parameter: Basic settings: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.</p>
BusL L12, L23 or L31 under H	<p>The left bus voltage L12, L23 or L31 is less than <i>BusLeft</i> <V for a time equal to <i>BusLeft V del</i>. The relative information will be saved in the board memory.</p> <p>The BusL protect parameter: <i>BusL Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged.</p> <p>The voltage must be more than <i>BusLeft</i> <V for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusL Volt prot</i> must be set to ENABLED)</p> <p>This alarm is activated if the protection is set to phase-phase voltage.</p> <p>This means that the parameter: Basic settings: <i>FixVoltProtSel</i> is set as PHASE-PHASE.</p>
BusL L12, L23 or L31 over H	<p>The left bus voltage L12, L23 or L31 is more than <i>BusLeft</i> <V for a time equal to <i>BusLeft V del</i>. The relative information will be saved in the board memory.</p> <p>The BusL protect parameter: <i>BusL Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged.</p> <p>The voltage must be more than <i>BusLeft</i> <V for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusL Volt prot</i> must be set to ENABLED)</p> <p>This alarm is activated if the protection is set to phase-phase voltage.</p> <p>This means that the parameter: Basic settings: <i>FixVoltProtSel</i> is set as PHASE-PHASE.</p>
BusR L1, L2 or L3 under H	<p>The right bus voltage L1, L2 or L3 is more than <i>BusRight</i> <V for a time equal to <i>BusRight V del</i>. The relative information will be saved in the board memory.</p> <p>The BusR protect parameter: <i>BusR Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged.</p> <p>The voltage must be more than <i>BusRight</i> <V for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusR Volt prot</i> must be set to ENABLED)</p> <p>This alarm is activated if the protection is set to phase-neutral voltage.</p> <p>This means that the parameter: Basic settings: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.</p>
BusR L1, L2 or L3 over H	<p>The right bus voltage L1, L2 or L3 is more than <i>BusRight</i> <V for a time equal to <i>BusRight V del</i>. The relative information will be saved in the board memory.</p> <p>The BusR protect parameter: <i>BusR Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged.</p> <p>The voltage must be more than <i>BusRight</i> <V for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusR Volt prot</i> must be set to ENABLED)</p> <p>This alarm is activated if the protection is set to phase-neutral voltage.</p> <p>This means that the parameter: Basic settings: <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.</p>



IN-SYNC NT



Message	Description
BusR L12, L23 or L31 under H	The right bus voltage L12, L23 or L31 is less than <i>BusRight <V</i> for a time equal to <i>BusRight V del</i> . The relative information will be saved in the board memory. The BusR protect parameter: <i>BusR Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged. The voltage must be more than <i>BusRight <V</i> for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusR Volt prot</i> must be set to ENABLED) This alarm is activated if the protection is set to phase-phase voltage. This means that the parameter: Basic settings : <i>FixVoltProtSel</i> is set as PHASE-PHASE.
BusR L12, L23 or L31 over H	The right bus voltage L12, L23 or L31 is more than <i>BusRight <V</i> for a time equal to <i>BusRight V del</i> . The relative information will be saved in the board memory. The BusR protect parameter: <i>BusR Volt prot</i> must be set as ENABLED if the Bus events are to be controlled and logged. The voltage must be more than <i>BusRight <V</i> for the BTB tie to start the synchronisation cycle. In fact, the parameter is used to control the BUS status (<i>BusR Volt prot</i> must be set to ENABLED) This alarm is activated if the protection is set to phase-phase voltage. This means that the parameter: Basic settings : <i>FixVoltProtSel</i> is set as PHASE-PHASE.
BusL f under H	The left bus frequency is less than <i>BusLeft <f</i> for the <i>BusLeft f del</i> . time. <i>The low frequency protection is based on the BusL protect thresholds: BusLeft <f and BusLeft f del.</i>
BusL f over	The left bus frequency is more than <i>BusLeft >f</i> for the <i>BusLeft f del</i> . time. <i>The low frequency protection is based on the BusL protect thresholds: BusLeft >f and BusLeft f del.</i>
BusR f under	The right bus frequency is less than <i>BusRight <f</i> for the <i>BusRight f del</i> . time. <i>The low frequency protection is based on the BusR protect thresholds: BusRight <f and BusRight f del.</i>
BusR f over	The right bus frequency is more than <i>BusRight >f</i> for the <i>BusRight f del</i> . time. <i>The low frequency protection is based on the BusR protect thresholds: BusRight >f and BusRight f del.</i>
Vb L1, L2 or L3 under H	The Bus voltage L1, L2 or L3 is less than <i>Bus < Hstlimit</i> for a time equal to <i>Bus V del</i> The undervoltage protection is adjusted via parameters Bus protect : <i>Bus < Hst</i> and <i>Bus V del</i> . These alarms are activated if the protection is set as phase-neutral voltage. This means that the parameter Basic settings : <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.
Vb L1, L2 or L3 over H	The Bus voltage L1, L2 or L3 is more than <i>Bus > Hstlimit</i> for a time equal to <i>Bus V del</i> . The undervoltage protection is adjusted via parameters Bus protect : <i>Bus > Hst</i> and <i>Bus V del</i> . These alarms are activated if the protection is set as phase-neutral voltage. This means that the parameter Basic settings : <i>FixVoltProtSel</i> is set as PHASE-NEUTRAL.
Vb L12, L23 or L31 under H	The Bus voltage L12, L23 or L31 is less than <i>Bus < Hst</i> for a time equal to <i>Bus V del</i> . The undervoltage protection is adjusted via parameters Bus protect : <i>Bus < Hst</i> and <i>Bus V del</i> . These alarms are activated if the protection is set as phase-phase voltage. This means that the parameter Basic settings : <i>FixVoltProtSel</i> is set as PHASE-PHASE.
Vb L12, L23 or L31 over	The Bus voltage L12, L23 or L31 is more than <i>Bus > Hst</i> for a time equal to <i>Bus V del</i> . The overvoltage protection is adjusted via parameters Bus protect : <i>Bus > Hst</i> and <i>Bus V del</i> . These alarms are activated if the protection is set as phase-phase voltage. This means that the parameter Basic settings : <i>FixVoltProtSel</i> is set as PHASE-PHASE.



IN-SYNC NT



Message	Description
f bus under H	The Bus frequency is less than $Bus <f$ for a time equal to $Bus f del$. The under-frequency is adjusted via parameters Bus protect : $Bus <f$ and $Bus f del$.
f bus over H	The Bus frequency is more than $Bus >f$ for a time equal to $Bus f del$. The over-frequency is adjusted via parameters Bus protect : $Bus >f$ and $Bus f del$.
Bus meas error A+H	A bus measurement error is generated if the bus voltage is beyond the set limits. See the details of parameters Gener protect : $BusMeasError$ in the <i>IGS-NT-x.y-Reference Guide</i> .
OfL StartBlck A+H	This alarm indicates an error in the setting of certain parameters and prevents start-up or charging. Incorrectly combined parameters: ProcessControl : <i>Island enable</i> ; <i>ParallelEnable</i> ; <i>Synchro enable</i> ; <i>MF start enable</i> . See the <i>IGS-NT-x.y-Reference Guide</i> for the SPTM, SPI or COMBI applications in the chapters relative to <i>AUT mode</i> section <i>OFF-MAN-AUT mode</i>
StartBlck A+H	This alarm indicates an error in the setting of certain parameters and disables engine start-up. Incorrectly combined parameters: ProcessControl : <i>Island enable</i> ; <i>ParallelEnable</i> ; <i>Synchro enable</i> ; <i>MF start enable</i> . See the <i>IGS-NT-x.y-Reference Guide</i> for the SPTM, SPI or COMBI applications in the chapters relative to <i>AUT mode</i> section <i>OFF-MAN-AUT mode</i>
BOC IDMT A+H	Indicates the protection has been triggered due to the generator IDMT current having been exceeded. The over current protection intervenes in a time that is inversely proportional to the current value. The higher the current, the shorter the response time. The protection is adjusted via parameters Generator protect : $2Inom del$ and Basic settings : <i>Nomin current</i> .
MPR Imains IDMT A+H	Indicates the protection has been triggered due to the mains IDMT current having been exceeded. The over current protection intervenes in a time that is inversely proportional to the current value. The higher the current, the shorter the response time. The protection is adjusted via parameters Mains protect : $Mains2Inom del$ and Basic settings : <i>Nomin current</i> . The protection is active if $Mns2Inom prot$ is enabled.
BOR lbusL IDMT A+H	Indicates the protection has been triggered due to the left bus IDMT current having been exceeded. The over current protection intervenes in a time that is inversely proportional to the current value. The higher the current, the shorter the response time. The protection is adjusted via parameters BusL protect : $BusL2Inom del$ and Basic settings : <i>Nomin current</i> . The protection is active if $BusL2Inom prot$ is enabled
BOC ShortCurr A+H	Short-circuit current limit exceeded in the generator current. The value set in the Generator protect has been exceeded: $Ishort$ for the time set in $Ishort del$.
BOC Overload A+H	Indicates the protection has been triggered due to the IDMT power having been exceeded. The generator overload protection intervenes in a time that is inversely proportional to the power value. The higher the power, the shorter the response time. The overload protection is adjusted via parameters Generator protect : $OverldStrtEval$ and $2POverldStEvDel$.
MPR Pmains IDMT A+H	Indicates the protection has been triggered due to the IDMT power having been exceeded. The mains overload protection intervenes in a time that is inversely proportional to the power value. The higher the power, the shorter the response time. The overload protection is adjusted via parameters Mains protect : $OverldStrtEval$ and $2POverldStEvDel$. The protection is active if $Mns2POvrlldProt$ is enabled.



IN-SYNC NT



Message	Description
BOR PbusL IDMT A+H	Indicates the protection has been triggered due to the IDMT power having been exceeded. The left bus power overload protection intervenes in a time that is inversely proportional to the power value. The higher the power, the shorter the response time. The overload protection is adjusted via parameters BusL protect: <i>OverldStrtEval</i> and <i>2POverldStEvDel</i> . The protection is active if <i>BusL2POvrldProt</i> is enabled.
BOC NCB fail A+H	Fault in the contactor of the neutral conductor. The board has not received the signal of the neutral contactor status auxiliary contact within 400 ms from the command.
Wrn BadPwrCfg A+H	The power formats vary in the different controllers within the same set of controlled generators. Check the formats set on Gen config in the <i>miscellaneous</i> board. (only editable in the advanced mode)
WrnTstOnLdFail A+H	This alarm is displayed if the test on load functions is activated and the unit has not been able to transfer the load from the mains within the time set in Sync/Load ctrl: Load ramp . This message is recorded in the alarms log. Increase the time set in <i>Load ramp</i> or check the engine speed adjustment
Wrn SpdRegLim A+H	This alarm indicates that the speed regulator control output has reached its limit. The warning is displayed when the speed control output falls within the values: <i>SpeedGovLowLim+0.2V</i> or <i>SpeedGovHiLim-0.2V</i> for at least 2 seconds. This alarm means that either the regulator is connected incorrectly or the relative parameters are set wrongly. This alarm is disabled if the SPEED down or SPEED up outputs are configured. See the <i>Sync/load control adjustment</i> Chapter in the <i>IGS-NT-x.y-Reference Guide</i> .
Wrn VoltRegLim A+H	This alarm indicates that the AVR voltage adjustment output has reached its limit. It is less than 2 % or greater than 98 % of the set values for at least 2 s. This alarm is activated if the voltage regulator is connected incorrectly or one of the adjustment parameters is not configured correctly. The alarm is disabled if one of the outputs is set as AVR up and AVR down. See the <i>Volt/PF control adjustment</i> paragraph in the <i>IGS-NT-x.y-Reference Guide</i> .
G L neg A	The generator phases are inverted. Check the connection of the generator phases as one of them is inverted.
G ph+L neg A	Incorrect generator phase sequence and one of the phases is inverted.
G ph opposed A	The generator phase sequence is incorrect. Check the generator phase connection. One of the generator phases is not connected correctly.
M L neg A	The mains phases are inverted. Check the connection of the mains phases.
M ph+L neg	The mains phases are inverted. Check the connection of the mains phases in the transformer.
M ph opposed	The bus phase sequence is incorrect. Check the connection of the mains phases.
B L neg	The bus phases are inverted.
B ph+L neg	Incorrect bus phase sequence and one of the phases is inverted.
B ph opposed	The bus phase sequence is incorrect
BL L neg	Incorrect left bus phase sequence and one of the phases is inverted.
BL ph+L neg	The left bus phases are inverted
BL ph opposed	The left bus phase sequence is incorrect
BR L neg	Incorrect right bus phase sequence and one of the phases is inverted.
BR ph+L ne	The right bus phases are inverted
BR ph opposed	The bus phase sequence is incorrect
hist PLC 1-4	Default message indicates forced activity from PLC functions



IN-SYNC NT



Message	Description
Fault reset	Alarms reset command signal. This can be activated from the <i>fault reset</i> key, binary input set as <i>FaultResButton function</i> , modbus or a remote connection (inteliMonitor)
ActCallCH1-OK, CH2-OK, CH3-OK H	Indication of an active call 1-3
ActCallCH1Fail, CH2Fail, CH3Fail A+H	Indication of an active call 1-3. See the <i>Inteli Communication Guide</i> for information regarding active calls. See the <i>IGS-NT-x.y-Reference Guide</i> for a description of the settings of the Act.calls/SMS .
Switched On H	The board has been switched on.
Watchdog H	Indication of an internal watchdog. Send the log file with the settings to Comap for verification.
System Error H	These messages can be logged as system errors due to: <ul style="list-style-type: none"> - <i>Firmware prog.error</i> (programming error) - <i>Disp error</i> (communication problems with the display). - RTC flat battery (see the information relative to this alarm) - <i>SetpointCS err</i> (parameter setting error) - <i>StaticsCS err</i> (statistic value error) - <i>Wrong config</i> (a configuration error has been logged) - <i>Power fail</i> (incorrect power supply - less than 8V)
System Log H	This message indicates that the board log has been deleted via the <i>Clear history function</i> in the GenConfig. This function forms part of the option toolbar.
SetpointChange H	Indication that the changed parameters have been registered. The history file contains the record of the changed parameters.
Password set H	Indication that the password has been set
Password chng H	Indication that the password has been changed
AccessCodeSet H	Indication that the access code has been set
AccessCodeChng H	Indication that the access code has been changed
Admin action H	This means that a change has been made by User 0 (administrator). The following operations can only be carried out by the administrator: <ul style="list-style-type: none"> - reset the passwords - modify the access permissions - change the user names
Terminal H	An external terminal has been connected or disconnected.
BinaryUnstable H	A binary input is unstable. This problem is usually caused by a fluctuating input due to an incorrect Earth connection. Check the Earth connection of the board.
ForceValue H	Indication that the forced binary input has been set. The forced on and off parameters are saved
TimeModeChange H	Indication that the summer/winter time change has been set. See the <i>#SummerTimeMod</i> parameter for the modifications.



IN-SYNC NT



Message	Description
GroupsLinked H	This indication in the log means that two generating sets have been connected together. The binary input set with the <i>GroupLink</i> function is used for the status indication. The parameters <i>Pwr management: GroupLinkLeft</i> and <i>GroupLinkRight</i> provide the necessary information to understand which gensets are in parallel if the input is active.
GroupsUnlinked H	The <i>GroupLink</i> binary input has been disabled. This means that two previously connected gensets have been disconnected.
Time stamp H	Adjusting the date and time. See parameters <i>Date/Time:Time stamp act</i> and <i>Time stamp per</i> .
Gen Peak start H	Indication that the genset has started-up according to peak absorption. See parameters ProcessControl: PeakLevelStart , PeakLevelStop and PeakAutS/S del. for information regarding this function
Gen Peak stop H	Indication that the genset has stopped after peak absorption. See parameters ProcessControl: PeakLevelStart , PeakLevelStop and PeakAutS/S del. for information regarding this function
Gen PMS start H	The generator has started-up via <i>Power management</i>
Gen PMS stop H	The generator has been stopped via power management
Overload H	Generator overload protection. See parameters Gener protect: OverldStrtEval and 2POverldStEvDel . Careful that this parameter is adjusted via parameters Basic settings: Nominal power setpoint setting.
Gen start H	Indication that the genset has been started-up via the start button.
Gen stop H	Indication that the genset has been stopped via the stop button.
Gen MF start H	Indication that the genset has been started-up via the AMF function
Gen MF stop	Indication that the genset has been stopped via the AMF function
Gen Rem start	Indication that the unit has been started-up via the <i>remote start/stop</i> input
Gen Rem stop	Indication that the unit has been stopped via the <i>remote start/stop</i> input
Load Shed	Indication that <i>load shedding</i> is activated and the relative output has been closed. See Load shedding parameters
Load Reconnect	Indication that <i>load shedding</i> is deactivated and the corresponding output has been opened. See Load shedding parameters
VectorShift H	Indication of <i>vector shift</i> protection. See parameters Mains protect: VectorS prot and VectorS limit .
Other CB trip	Other CB (battery chargers) have been triggered; this information is available for circuit breakers that are controlled by a Comap controller (IG/IS-NT or IM-NT).
GCB opened	GCB is open
GCB closed	GCB is closed
MCB opened	MCB is open
MCB opened ext	MCB is opened by an external operation
MCB closed	MCB is closed
MGCB opened	MGCB is open
MGCB closed	MGCB is closed
BTB opened	BTB is open
BTB opened ext	BTB is opened by an external operation
BTB closed	BTB is closed
SyncStarted	Direct synchronisation has started



IN-SYNC NT



Message	Description
RevSyncStarted	Inverse synchronisation has started
Ready	Unit ready to start-up
Idle run	Engine is on (<i>engine running</i> conditions met) and engine speed and alternator voltage reach the nominal values when running at minimum
Running	Genset is on and GCB is waiting to be closed
Warming	Engine warming function. When used in parallel with the mains, the load is reduced according to the <i>Warming load level</i> setting. For further information regarding this function, see parameters Engine params: Warming load, Warming temp, Max warm time.
Soft load	The genset load is increased according to parameters Sync/Load ctrl: Load ramp, Load gain, Load int, RampStartLevel setpoints setting
Loaded	Loaded genset
Soft unload	The genset load is decreased according to parameters Sync/Load ctrl: Load ramp, Load gain, Load int. also consider parameters Sync/Load ctrl: GCB open level and GCB open del.
Cooling	Cooling cycle
Emerg man	Binary input for manual emergency operation activated
Not ready	The genset is not ready to start-up. Either the board is in OFF mode or a second level alarm is active.